

WHAT IS CLAIMED IS:

1. Method for illuminating an object with light (2) from a laser light source (3), preferably in a confocal scanning microscope (1), characterized in that the phase angle of the light field is varied by a modulation means (4) in such a way that interference phenomena do not occur in the optical beam path, or occur only to an undetectable extent, within a predetermined time interval.
 2. Method according to Claim 1, characterized in that an EOM (4) (electro-optical modulator) is employed as the modulation means.
 3. Method according to Claim 2, characterized in that the EOM (4) is arranged directly downstream of the laser light source (3).
 4. Method according to Claim 1, characterized in that a mirror, a lens or a beam splitter is used as the modulation means (4).
 5. Method according to Claim 4, characterized in that the modulation means (4) is mounted in such a way that it also vibrates or oscillates as a result of vibrations or oscillations of the optical structure or of the casing.
 6. Method according to Claim 4, characterized in that the modulation means (4) is moved using a control element.
 7. Method according to Claim 6, characterized in that the control element is a piezo element.
 8. Method according to Claim 1, characterized in that the modulation means influences the laser light source.
 9. Method according to Claim 8, characterized in that the modulation means switches the laser light source on and off.

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10. Method according to Claim 8, characterized in that the modulation means influences the pump current of the laser.
11. Method according to Claim 8, characterized in that the modulation means influences the intensity of the laser light source.
12. Method according to Claim 8, characterized in that the modulation means influences the laser resonator or the optical medium of the laser.
13. Method according to Claim 12, characterized in that the modulation means is a piezo element which moves and/or deforms at least one component of the laser resonator and/or the optical medium.
Sub a1
14. Method according to one of Claims 1 to 13, characterized in that a noise signal (5), a periodic signal (5) or a stochastic signal (5) is applied to the modulation means.
Sub a2
15. Method according to Claim 14, characterized in that a noise generator (7) is used to produce the noise signal (5).
16. Method according to one of Claims 1 to 15, characterized by use in a confocal scanning microscope (1).
Sub a3
17. Method according to Claim 16, characterized in that the predeterminable time interval is shorter than the pixel clock of the confocal scanning microscope (1), preferably shorter than the time interval corresponding to half the pixel clock.
18. Method according to one of Claims 1 to 17, characterized in that the modulation is synchronized with the scanning process of the confocal scanning microscope (1).
Sub a4
19. Method according to one of Claims 1 to 18, characterized in that a change in the wavelength of the laser light (6) due to the modulation is taken into

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account by the control unit of an AOTF (acousto-optical tunable filter) or AOBS (acousto-optical beam splitter) which injects the laser light.

20. Method according to one of Claims 1 to 19, characterized in that a change in the power of the laser light (6) due to the modulation is taken into account by the control unit of an AOTF or AOBS which injects the laser light.

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